Reflex responses associated with activator treatment
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Abstract

**Background:** Previous studies have demonstrated the existence of a reflex response, measurable by surface electromyography (sEMG), after manually delivered spinal manipulative therapy (SMT). This reflex response has been characterized as consistent, reproducible within individual subjects, and nonlocal because it extends beyond the site of manipulation. However, the nature and magnitude of possible reflex responses in the paraspinal and proximal limb muscles elicited by nonmanual SMT, such as with an adjusting instrument, remain unknown. **Objective:** To characterize the reflex responses associated with (nonmanual) SMT by using sEMG to record the responses of 16 muscles before, during, and after treatment. **Study design:** The electromyographic responses of 16 para-spinal and proximal limb muscles in 9 healthy, asymptomatic male volunteers were measured simultaneously by sEMG before, during, and after chiropractic SMT. **Methods:** SMT thrusts were delivered to 9 asymptomatic volunteers at 6 bilateral sites (C3/4, T2/3, T6/8, T11/12, L2-4, and S1). Reflex responses were measured from 16 muscles with bipolar sEMG electrodes and collected at 2000 Hz per channel with data acquisition software. **Results:** Approximately 68% of the SMT thrusts resulted in a detectable reflex response. The cervical spine resulted in a detectable response of 50%, thoracic spine 59%, lumbar spine 83%, and sacroiliac joints 94%. Treatments delivered to the thoracic spine elicited the largest peak-to-peak amplitude sEMG responses, whereas the lumbar spine demonstrated the most heterogeneous responses. When a reflex response was observed, it always occurred close to the treatment site ipsilaterally and was detected in muscles that had either their origin or insertion at the vertebral level that was adjusted. **Conclusions:** Based on the local nature, magnitude, and characteristic shape of all reflex responses observed, we hypothesized that they were likely generated by a single proprioceptor. Furthermore, the temporal properties of this reflex response suggest that they originated from the muscle spindles. In contrast to previous observations on reflex responses after manual SMT, these treatments elicited reflex responses that varied between subjects but were consistent within an individual and were local in nature. We conclude that SMT delivered in this manner results in a reflex response that is both quantitatively and qualitatively different from a manual SMT. (J Manipulative Physiol Ther 2000;23:155–9)